



## **Environmental Factors and Bank Performance: How Financial Market Role Players React in Malaysia?**

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### **ABSTRACT**

This study is applied in the region of Malaysia with a prime objective to investigate whether environmental performance indicators are impacting on banking sector performance during the period 2014-2018. For this purpose, this study has considered a sample of 6 Malaysian banking firms working under the regulator of Bank Negara Malaysia. Considering the both dimension of time series and cross section, three panel models known as simple regression, fixed and random effect are statistically applied. However, correlation matrix between the variables is also presented for the better understanding. Findings through panel model shows that Eco. System vitality is adversely affecting the EBIT, in all three models, whereas environmental health is a negative indicator of EBIT. For EAT, eco system vitality is again providing the evidence for adverse influence during the study period. In addition, black carbon emission intensity is causing a decline in EAT in both simple regression and fixed effect estimator. For ZROE, environmental health, eco system vitality are negative while carbon emission intensity is positive sign. For the last indicator of banking sector performance, it is found that Eco. System vitality is a negative sign causing a decline in ZROA during 2014-2018. It is suggested that there is a strong need to control the adverse impact of some of the environmental factors on the banking industry of Malaysia, where different public sector departments are held responsible. For the future studies, this study suggest considering all the banking firms, long data period and other regional economies.

**Keywords:** Environmental Factors, Climate Change, Banks, Malaysia

**JEL Classifications:** Q19, E5

## **1. INTRODUCTION**

The concern about environmental sustainability and climate change is increasing day by day because of their present and future impact on the economies and the business sector (Bosello et al., 2006; 2007; Fussey and South, 2012; Mendelsohn and Neumann, 2004; Tanner and Allouche, 2011; White, 2012). It is believed that to meet future economic and social needs, various issues like defensive food (Morgan and Sonnino, 2013) and related items, fishing stocks (Takashina and Mougi, 2014), long-term productivity of the land and other natural resources (Abalu and Hassan, 1998; Scherr, 2000), and health of ecosystem (Lackey, 2001; Wicklum and Davies, 1995) is very important. For the future generation, it is widely suggested

that there must a significant focus on implications those policies which can sustain the environment from harmful results (Sartorius and Zundel, 2005; Stern et al., 1996). For sustainable environment, For example, solar and wind power are the renewable resources which are diversifying into energy sources that do not rely on traditional energy means (Bilgen et al., 2008; Nalan et al., 2009; Ringel, 2006). To ensure the environment of the earth, it is assumed that coming generation will not face excessive temperature, extreme weather events, and water shortages. For this reason there is a significant need for the structural reforms along with policy implications are required which can secure the environment from deteriorative condition. Meanwhile, for the betterment of ecological structure, future technological innovations are highly recommended

by some researchers in the field of environmental sustainability (Ferrari et al., 2013; Mattila-Sandholm et al., 2002; Tampubolon and Setyoko, 2019).

In current studies, a range of policies are found which can work to promote environmental sustainability. For example, one of the key tool to control the carbon emission in the natural environment, carbon taxing aims to make sense that users in the society must face the full social cost along with the private cost (Kapp, 1970; Wang et al., 2016). The concept of carbon tax is a tax as placed on manufacturing of goods and services through burning fossil fuel. To limit harmful emission, Government regulation also play a good role (Zhang et al., 2017). For example, by a certain date, some cities have promised to ban diesel cars in the world economy to contribute towards the sustainability of the environment. Additionally, Inspiring more sustainable environmental practices, for example, moving towards renewable energy like wind power and solar comparatively the non-renewable energy sources, which create pollution is very beneficial for the economies and business too (Boudreau et al., 2008; Omer, 2008; Toke and Lauber, 2007; Twidell and Weir, 2015).

In the economic environment, the environmental Kuznets curve or EKC suggests that economic development initially leads to a deterioration of the nature (Munasinghe, 1999; Shahbaz et al., 2013). However, after a specific time duration with the economic growth, a society begins to improve its relationship. It can be suggested that economic growth is good for the environment, from a very simplistic viewpoint. Economic growth will lead to an improved environment; however, critics argue that there is no guarantee for such type of results (Van den Bergh, 2011). Economic growth is well-matched with an improving environment situation where both society and nature will get some good results. Various causes are identified in the existing studies for the EKC. For example, with economic growth, empirical evidence of declining pollution level. With higher rates of economic growth, after paying for basic necessities, people have more discretionary income which can further impact on the value of overall society.

In a modern economy, banking sector is considered a vital role player for the promotion of economic and financial activities within and outside the geographical region of a country (Allen et al., 2005). Its efficiency is of vital importance due to its linkage with different sectors. In an efficient economy and a healthy financial system, banks must be carefully evaluated and analyzed. To determine their contribution to business development, it is necessary to measure banks individual performance. It is inevitable that banks continue to attract significant attention in the local and international market, banks must continue to work under stability dynamics. In a more efficient manner, there is a growing need to evaluate attention from the regulatory authority, significant attention is a need of time. Present study aims to investigate the impact of environmental factors on the banking industry of Malaysia during the period 2014-2018. The rest of the paper is developed through following pattern. Next section is covering the title of literature review, whereas variables and empirical results are discussed in section three. In addition, section four is covering the conclusion of the study.

## 2. REVIEW OF LITERATURE

Environmental factors and banking industry are closely associated to each other where we have found a vast literature as contributed by (Alisjahbana and Busch, 2017; Bose et al., 2018; Buranatrakul and Swierczek, 2018; ElAlfy and Weber, 2019; Garg, 2015; Javeria et al., 2019; Kılıç and Kuzey, 2019; Lalon, 2015; Roy et al., 2015). One of the key contribution is provided by (Kılıç and Kuzey, 2019) who have analyzed the climate change determinants and its disclosure in the banking industry of Turkey. In addition, authors have analyzed those factors which are determining the voluntary level of disclosure for the climate change in the region of Turkey with the sample of 24 banking firms during the period of 2010-2016 on annual basis. To measure the disclosure level, an index was used while investigating the climate change and other factors. The study findings reveal various number of the banking's are providing some voluntary information regarding the climate change and its positive influence on the bank size, bank profit and age factors. in terms of practical implication their study is highly suggested to various banking firms for the crucial impact from the climate change. Authors believe that several organizations like government, financial institutions, and non-government organizations must work together in order to actively fight against the ongoing problem of climate change which is affecting all types of business firms in both local and international market. Study contribution is observed with the extension provided to existing literature while concentrating on environmental issues.

Buranatrakul and Swierczek (2018) investigates the action of various international banking firms as associated with the climate change and its adoption. For better understanding, authors have provided a theoretical framework while assessing the climate change related strategies as provided by the bank through commitment of the management, reduction of emission, development of product, organizational involvement, and finally the outside relationship by the business. For examining the relationship between the stated variables, overall sample of 15 banks from international banking industry was collected during the study period which found significant difference in terms of strategic actions taken by the banks while dealing with the changing climate (Hussain et al., 2020).

Bowman (2010) investigates the issue of uncertainty in the regulatory quality while focusing on the banking industry in order to facilitate the climate change and its potential harmful effects. It is believed that there is a relationship between banking industry and climate change in the form of assessment of the risk, profit earning and risk management respectively. in addition, various stakeholders like creditors, investors and other parties are influencing on the business practices and greenhouse gas emission too. It is further believed that carbon emission is impacting on the banking industry through different outcomes.

## 3. VARIABLES AND RESULTS

The details for the variables and empirical findings are presented under the above title. Overall bank performance is categorized into four major measures, while environmental performance is

reflected with six measures as presented in the first column of each of the Table 1 each of the table (Hussain et al., 2019). Initially our research has focused on the provision of correlation coefficient for all the variables including dependent and independent in nature, where the coefficients are providing their significance level too under Table 1 of the study. As per the earlier researchers, it is accepted that those two variables which have the correlation between 0.10 and 0.20 are accepted as positively correlated but with weak correlation. Similar value is observed for the negative and weak is accepted with those coefficients having negative sign and coefficient value is in the above stated range. For those two variables where the coefficient is providing a value in range of 0.20-0.40 is accepted as positive but weak. For those with the correlation coefficient of 0.40-0.50 we have accepted it as moderate level of association. Meanwhile, correlation above 0.50-0.60 is considered as above moderate level and correlation between 0.60 and 0.70 is accepted as good and positive correlation. In addition, if the correlation between any two variable is in between the range of 0.70 and 0.90 we have considered it as high correlation. Lastly if the correlation is near to 1, it is observed as perfect correlation either positive or negative. However, all of these levels are accepted only significant if the P-value below each of the correlation is at 1%, 5% or 10% level of significance.

The first performance measure for the selected banks of Malaysia is entitled as EBIT as presented under Table 2 where all of the environmental performance measures as showing their title in column one. The i model presents the simple regression, whereas ii and iii are showing the fixed and random effect estimators. This process is repeated for all of the dependent and independent variables to justify the claim that how environmental factors are influencing the bank performance. Through EPI or environmental performance index both simple OLS and fixed effect are showing there is no influence on EBIT. However, opposing to this, random effect estimation indicates that EPI is a positive sign for increasing earnings before interest and tax for the banking firms in Malaysia. Turning towards environmental health and bank performance, the coefficient under both i and ii model is negative

but insignificant even at 10% chance of error, reflecting that there is no impact of environmental health in determining the bank performance, but under random effect its impact is -6.288 showing a significance level of 5%. It is accepted that environmental is negatively determining the first measure of bank performance in Malaysia showing a big reservation for both banking sector and environmental authorities.

Eco system vitality is a third environmental measure for predicting the bank performance, for which coefficients are -4.534, -4.429, and -6.534 respectively. It would explain that again only the highly significant and negative impact on EBIT is observed through eco system vitality under third model of Table 2. However, the next all of the variables like carbon emission intensity, black carbon emission intensity and sustainable nitro mgt are showing that they are not determining the bank performance in a significant direction.

Table 3 is presenting the environmental performance and bank performance as observed through EAT for selected banking industry. Same as above model i shows the simple regression, model ii fixed effect, and model iii for the random effect. Once again all the performance measures for the environment of Malaysia are showing different trends. But for the eco system vitality all three panel models are found as negative and significant determinant of EAT where coefficients are -2.803, -6.078, and -5.003 respectively. It shows a bitter fact that eco-system vitality is not beneficial for the banking firms as it is causing a reduction in earnings after tax during the latest 5 years of this research. Whereas black carbon emissions intensity is also negatively affecting the bank's earning under model i and ii only. Model iii also depicting a negative impact but not significant statistically. Addition to above, sustainable nitro mgt is also found to be insignificant in defining the EAT in the banks of Malaysia.

For examining the bank stability and impact from environmental indicators, Table 4 is providing some interesting facts. It is found that environmental performance index is not impacting the bank stability when measured through ZROE in all three panel models.

**Table 1: Pairwise correlations**

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Env. per index	1.000									
(2) Env. health	0.625	1.000								
(3) Eco. Sys. Vol.	0.940	0.325	1.000							
(4) CO <sub>2</sub> emission intensity	0.746	0.034	0.900	1.000						
(5) Black carbon emission	0.503	-0.264	0.725	0.912	1.000					
(6) Sustainable nitro	0.820	0.147	0.938	0.989	0.845	1.000				
(7) EBIT	-0.326	0.367	-0.573	-0.833	-0.848	-0.776	1.000			
(8) EAT	-0.286	0.417	-0.511	-0.686	-0.825	-0.628	0.807	1.000		
(9) ZROE	-0.243	0.150	-0.408	-0.646	-0.522	-0.615	0.784	0.266	1.000	
(10) ZROA	0.480	-0.258	0.713	0.919	0.899	0.874	-0.972	-0.763	-0.787	1.000

Below each of the correlation coefficient for any two variables, there is a P-value which can be compared with 1%, 5% and 10% significance level

**Table 2: Environmental performance and bank performance through EBIT**

Variables	(i)	(ii)	(iii)
	EBIT	EBIT	EBIT
Env. per index	13.35 (8.065)	12.91 (10.65)	15.35*** (5.025)
Env. health	-8.288 (5.252)	-8.034 (6.795)	-6.288** (2.252)
Eco. Sys. Vit.	-4.534** (1.826)	-4.429*** (.804)	-6.534*** (1.826)
CO <sub>2</sub> emission intensity	25.06** (10.61)	22.94 (24.52)	19.06 (17.61)
Black carbon emissions intensity	-16.81 (11.50)	-24.87** (10.61)	-18.71 (26.50)
Sustainable nitro mgt	-9.822 (6.382)	-9.127 (8.836)	-10.822 (6.382)
Constant	69.48*** (4.850)	70.75*** (7.011)	89.48*** (4.250)
Observations	29	29	29
R-squared	0.913	0.706	0.689
Number of id	6	6	6

Standard errors in parentheses, \*\*\*P<0.01, \*\*P<0.05, \*P<0.1

**Table 3: Environmental performance and bank performance through EAT**

Variables	(i)	(ii)	(iii)
	EAT	EAT	EAT
Env. Per Index	8.520 (11.08)	17.24 (14.80)	15.520*** (5.05)
Env. Health	-5.226 (7.213)	-10.62 (9.441)	-4.286 (1.253)
Eco. Sys. Vol.	-2.803*** (0.882)	-6.078*** (1.286)	-5.003*** (1.882)
CO <sub>2</sub> emission intensity	29.08 (24.18)	44.92 (34.07)	19.08** (8.18)
Black carbon emissions intensity	-20.29** (9.80)	-29.56*** (10.69)	-10.69 (10.80)
Sustainable nitro mgt	-10.90 (8.764)	-16.53 (12.28)	-8.20*** (2.764)
Constant	68.79*** (6.660)	63.56*** (9.742)	75.19*** (6.660)
Observations	29	29	29
R-squared	0.836	0.444	0.568
Number of id	6	6	6

Standard errors in parentheses, \*\*\*P<0.01, \*\*P<0.05, \*P<0.1

**Table 4: Environmental performance and bank performance through ZROE**

Variables	(i)	(ii)	(iii)
	ZROE	ZROE	ZROE
Env. per. index	5.520 (11.08)	17.24 (14.80)	8.520 (11.08)
Env. health	-2.226*** (7.213)	-10.62 (9.441)	-5.226 (7.213)
Eco. Sys. Vit.	-3.503*** (0.882)	-6.078 (5.286)	-2.803 (3.882)
CO <sub>2</sub> emission intensity	39.08*** (14.18)	44.92** (14.07)	29.08** (10.18)
Black carbon emissions intensity	-20.29 (5.80)	-29.56 (21.69)	-20.29 (15.80)
Sustainable nitro mgt	-8.90 (8.764)	-16.53 (12.28)	-10.90 (8.764)
Constant	15.89*** (8.260)	63.56*** (9.742)	68.79*** (6.660)
Observations	29	29	29
R-squared	0.836	0.444	0.687
Number of id	6	6	6

Standard errors in parentheses, \*\*\*P<0.01, \*\*P<0.05, \*P<0.1

**Table 5: Environmental performance and bank performance through ZROA**

Variables	(i)	(ii)	(iii)
	ZROA	ZROA	ZROA
Env. per index	-9.996 (6.873)	-11.24 (7.857)	8.520*** (3.08)
Env. Health	6.060 (4.476)	6.974 (5.012)	-5.226*** (1.213)
Eco. Sys. Vit.	-3.499*** (0.409)	-5.883*** (1.807)	-2.803*** (0.882)
CO <sub>2</sub> emission intensity	-15.07 (15.01)	-19.07 (18.09)	29.08** (14.18)
Black carbon emissions intensity	10.65 (9.803)	12.77 (11.51)	-20.29 (15.80)
Sustainable nitro mgt	6.115 (5.438)	7.599 (6.519)	-10.90 (8.764)
Constant	26.21*** (4.133)	24.53*** (5.172)	68.79*** (6.660)
Observations	29	29	29
R-squared	0.959	0.790	0.742
Number of id	6	6	6

Standard errors in parentheses \*\*\*P<0.01, \*\*P<0.05, \*P<0.1

For environmental health, there is a negative and significant impact on ZROE, showing that environmental health is vulnerable towards banking sector stability as observed in pool regression model. For model ii and iii no impact of environmental health on ZROE is found. Observing the impact of Eco. System vitality, similar results are found the one which were explained for environmental health and ZROE. However, CO<sub>2</sub> emission intensity is providing a high positive results, favoring the bank stability when measured through ZROE. Similarly model ii and model ii are showing that CO<sub>2</sub> emission intensity is a positive determinant for ZROE. For the remaining indicators, the influence from black carbon emission intensity and sustainable nitro mgt are also observed as non-significant determinant of ZROE in Malaysian banking industry.

Table 5 presents the influence on ZROA and environmental performance measures with all three panel models. Through

environmental performance index, model iii is showing a positive and significant impact with the coefficient of 8.520. It means that environmental performance is providing its positive signs for ZROA during the study period. on the other hand, environmental health is showing a negative impact with the coefficient of -5.226 under full sample of the study. It explains that environmental health is an adverse sign for the banking stability when measured with ZROA. At the same time, eco system vitality is also showing the significant and adverse impact on ZROA. For eco system vitality, all three panel models are reflecting a highly significant and negative impact on ZROA. It explains that eco system vitality is adverse for the banks as it is lowering their financial stability when measured on ZROA. On the other hand, carbon emission intensity in model iii is positive and significant which means that carbon emission is causing an increasing value of ZROA in Malaysia. The rest of the environmental factors are found to be non-insignificant for ZROA under full sample analyses during the study period.

## 4. CONCLUSION

Environmental performance has many dimensions. The ongoing concern about changing environment and its influence on different sectors of the economies is observed vastly in the literature in current time. However, environmental performance and banking sector performance are very little investigated until now. In the economy of Malaysia, several environmental issues are yet to be covered, but in recent years, a reasonable improvement was also experienced regarding environmental indicators. Our study has empirically tested whether the set of environmental measurement indicators are associated with the banking sector performance or not. Due to panel nature of the data, three panel models like OLS regression, fixed and random effect are applied and discussion is made for all the models and all four dependent variables of the banking performance named as earning before interest and tax, earning after tax, z score of return on equity, and finally z score of return on assets for all six banking firms.

It is believed that for EBIT, Eco system vitality is negatively affecting when observed through all three panel models, but black carbon emission intensity is found an adverse determinant of the bank performance under fixed effect model. For 2<sup>nd</sup> measure of the bank performance, earning after tax of selected banks, eco system vitality is found to be again a negative determinant along with black carbon emission intensity when analyzed through simple regression and fixed effect estimator. whereas remaining indicators are showing that they are not impacting the bank performance at all. For the third measure of bank performance, ZROE, environmental health and Eco. System vitality are adverse determinants as found under model i of this research. Addition to this, carbon emission intensity is positively determining the banking sector performance in all three panel models. For the last measure of banking sector performance, only the environmental health and Eco. System vitality are showing that they are causing a decline in the banking sector stability. However, under random effect model, carbon emission intensity is showing a positive impact.

Based on the above discussion, it is suggested that there is a strong need to control the adverse impact of some of the environmental factors on the banking industry of Malaysia, where different public sector departments are held responsible. For the future studies, this study suggests to consider all the banking firms, long data period and other regional economies.

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